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ARAŞTIRMA / RESEARCH

Relationship between blood groups and anogenital wart development

Kan grupları ile anogenital siğil gelişimi arasındaki ilişki

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Abstract

Purpose: Since the discovery of the ABO blood group, the potential role of blood groups in infectious diseases has been investigated. Some viral infections, despite viral contact, do not occur or are not symptomatic due to ABO blood groups. It is known that not all patients in contact with HPV develop clinical disease. To our knowledge, the relationship between ABO-Rh groups and anogenital wart has not been investigated previously.

Materials and Methods: 96 patients with anogenital wart and 286 sexually active patients with blood group records were included in this study. Age, sex and blood groups of the patient and control groups were retrospectively analyzed. The results were analyzed statistically.

Results: In terms of ABO blood groups, 41 (42.7%) patients had A, 21 (21.9%) patients had B, 11 (11.5%) patients had AB, 23 (23.9%) patients had 0 blood groups in the patient group. In the control group, there were 126 (44.1%) individuals A, 46 (16.1%) individuals B, 30 (10.5) individuals AB, 84 (29.3) individuals had 0 blood group. The difference between the groups was not significant. In terms of Rh groups, 85 (88.5%) patients were Rh (+) and 11(11.5%) patients were Rh (-). In the control group, 240 (83.9%) individuals were Rh (+) and 46 (16.1%) were Rh (-). The difference between the groups was not.

Conclusion: There was no relationship between ABO-Rh groups and anogenital wart development. To clarify whether anogenital wart development is easy in some blood groups, further studies are needed in different races and geographic regions.

Keywords: genital wart, human papilloma virus, ABO blood group system

Öz

Amaç: ABO kan grubunun keşfedilmesinden bu yana, kan gruplarının bulaşıcı hastalıklarda potansiyel rolü araştırılmıştır. Bazı viral enfeksiyonlar, viral temasa rağmen, ABO kan grupları nedeniyle ortaya çıkmaz veya semptomatik değildir. HPV ile temas eden tüm hastaların klinik hastalık geliştirmediği bilinmektedir. Bildiğimiz kadarıyla ABO-Rh grupları ile anogenital siğil arasındaki ilişki daha önce araştırılmamıştır.

Gereç ve Yöntem: Çalışmaya anogenital siğilli 96 hasta ve kan grubu kayıtları olan 286 cinsel açıdan aktif hasta dahil edildi. Hasta ve kontrol grubunun yaş, cinsiyet ve kan grupları retrospektif olarak incelendi. Sonuçlar istatistiksel olarak analiz edildi.

Bulgular: ABO kan grupları açısından 41 (% 42.7) hastada A, 21 (%21.9) hastada B, 11 (% 11.5) hastada AB, 23 (%23.9) hastada 0 kan grubu vardı . Kontrol grubunda 126 kişi (% 44.1) A, 46 kişi (%16.1) B, 30 kişi (10.5) AB, 84 kişi (29.3) 0 kan grubuna sahipti. Gruplar arasındaki fark anlamlı değildi. Rh grupları açısından 85 (%88.5) hasta Rh (+) ve 11 (%11.5) hasta Rh (-) idi. Kontrol grubunda ise 240 (%83.9) birey Rh (+) ve 46 (%16.1) Rh (-) idi. Gruplar arasındaki fark anlamlı değildi.

Sonuç: ABO-Rh grupları ile anogenital siğil gelişimi arasında ilişki yoktu. Bazı kan gruplarında anogenital siğil gelişiminin kolay olup olmadığını netleştirmek için, farklı ırklarda ve coğrafi bölgelerde yapılacak daha fazla çalışmaya ihtiyaç vardır.

Anahtar kelimeler: genital siğil, insan papilloma virüsü, ABO kan grubu sistemi

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INTRODUCTION

Anogenital wart is an important public health problem, especially in developing countries. The prevalence of anogenital warts is between 5% and 20%, it is usually asymptomatic, but adversely affects the psychology of patients and reduces the quality of life[1]. These lesions, which can be located anywhere in the genital area, are most commonly seen in the external genital area[2].

The antigens of the ABO blood group family have been known for a long time. ABO system is the most researched erythrocyte antigen system because of its easy identification of phenotypes[3]. ABO blood group is a useful and valuable resource because of the lack of inheritance of blood groups. The distribution of ABO and Rh blood groups may vary between nations and races[4].

Genetic factors such as blood group antigens can have an impact on the development and severity of some diseases, and many studies have shown that some diseases are associated with some blood groups, although there is no single result. Many epithelial cells including skin cells express blood group antigens are on their surfaces. These antigens are oligosaccharides involved in various biological processes such as cell movement, tissue differentiation, inflammation and bacterial adhesion[5,6]. Since the relationship between blood group A and gastric cancer was reported in 1953, the relationship of many cancers and diseases with blood groups has been investigated[3]. The relationship of blood groups with different diseases such as small cell lung tumor, esophageal carcinoma, breast cancer, predisposition to dermatophytosis, lichen planus, seborrheic dermatitis, vitiligo, pemphigus, psoriasis, systemic lupus erythematosus were investigated[5,7].

Since the discovery of the ABO blood group, the potential role of blood groups in infectious diseases has been investigated[8]. The role of blood groups in susceptibility to infectious diseases has long been debated. Many studies have shown a relationship between blood groups and susceptibility to various infectious diseases. Some viral infections, despite viral contact, do not occur or are not symptomatic due to ABO blood groups[9]. In this study, we aimed to investigate whether there is a relationship between anogenital wart development which is an infectious viral disease and ABO-Rh groups.

MATERIALS AND METHODS

The study included 96 anogenital wart patients who were admitted to the our dermatology clinic between January 2018-December 2018 and 286 patients whom had blood group records were included in this study. The ethics committee approval dated 21.02.2019 and numbered 2019/04 was obtained from the Clinical Research Ethics Committee of Van Training and Research Hospital. Informed consent was obtained from all patients.

Sexually active 96 patients aged 18-65 years with anogenital wart diagnosis and ABO-Rh blood group were evaluated retrospectively. The control group consisted of 286 sexually active individuals presenting to the outpatient clinic and had ABO-Rh blood group records. Individuals with wart, rheumatoid arthritis, systemic lupus erythematosus, pemphigus, Behçet's disease and inflammatory bowel disease were not included in the control group. The patient group consisted of clinically confirmed anogenital wart patients. Patients with other sexually transmitted diseases which may cause lesions in the anogenital region such as Molluscum contagiosum were not included in this study. The patient and control group were classified as A, B, AB, O according to their blood group and Rh + and Rh- according to their Rh status.Age, sex and blood groups of the both groups were recorded.

Statistical analysis

Statistical analysis was performed using the SPSS 21.0 for Windows (SPSS Inc., Chicago, IL, USA) program. Number, percentage, standard deviation and mean were used as descriptive statistical methods. The relationship between variables was evaluated by chi-square analysis. To compare quantitative continuous data between two independent groups, T test was used. In all analyzes, p value below 0.05 was accepted statistically significant.

RESULTS

In this study, 96 patients with anogenital warts and 286 individuals with blood type were included. Of the 96 patients included in the study, 24 (25%) were female and 72 (75%) were male. The ages of the patients ranged between 19-71 years and the mean age was 33,08 ± 10,22 years. The control group consisted of 286 people; 99 (34.6%) women and 187

(65.4%) men. The age of the control group ranged from 18 to 60 and the mean age was 32.52 ± 9,06 years. There was no significant difference between the patient group and the control group in terms of age and sex (p> 0.05).

In terms of ABO blood groups, 41 (42.7%) patients had A, 21 (21.9%) patients had B, 11 (11.5%) patients had AB, 23 (23.9%) patients had 0 blood groups in the patient group. . In the control group, 126 (44.1%) individuals had A, 46 (16.1%) individuals had B, 30 (10.5) individuals had AB, 84 (29.3) individuals had 0 blood group. There was no significant difference between the groups (p> 0.05). In terms of Rh groups, 85 (88.5) patients were Rh (+) and 11(11.5) patients were Rh (-). In the control group, 240 (83.9%) individuals were Rh (+) and 46 (16.1%) were Rh (-). There was no significant difference between the groups (p> 0.05). ABO and Rh blood groups of the patient and control groups are given in Table 1.

Table 1: ABO and Rh blood groups of the patient and control groups

ABO and Rh groups	Group		*P* value
	Patient (n=96)	Control (n=286)	
A	41	126	>0.05
Rh(+)	35	101	
Rh(-)	6	25	
B	21	46	>0.05
Rh(+)	16	42	
Rh(-)	5	4	
AB	11	30	>0.05
Rh(+)	11	23	
Rh(-)	0	7	
O	23	84	>0.05
Rh(+)	23	74	
Rh(-)	0	10	

DISCUSSION

In the Pubmed database, we didn't find any other study investigating the relationship between ABO-Rh groups and anogenital wart development. Anogenital wart is a tumor-like lesion most commonly caused by HPV type 6 and 11. Anogenital wart is a benign lesion that can be found in any part of the genital region, especially in the external genital region[1]. Blood groups, hemoglobin variants, erythrocyte cell isoenzymes and serum proteins are genetic markers used to identify human gene variations, such as HLA systems. There are four common blood types in the ABO system: O, A, B and AB[10,11]. ABO blood group system was discovered in 1900. The second most important blood group system after ABO is Rhesus system. The erythrocyte surface of a people may or may not have Rh factor or immunogenic D antigen. Accordingly, the condition is defined as Rh positive (D antigen present) or Rh negative (D antigen absent) [11].

ABO blood groups are identified by carbohydrate fragments on the extracellular surface of erythrocyte cell membranes. Erythrocyte cell antigens have various functions such as structural integrity of the membrane, transport of molecules from membranes and adhesion[12]. There are more than 30 proteins and sugars that are considered to be markers of blood groups, but the most antigenic ones are independently separated in the genes found for chromosome 9q34 (for ABO) and 1p36 (for Rh (D)). They are expressed in a Mendelian codominant manner[6,7].

ABO antigens are commonly expressed in many tissues including intestinal mucosa, endothelium, heart, kidney and other organs, in addition to erythrocytes. They are also present in the form of soluble oligosaccharides in most body fluids except cerebrospinal fluid. The oligosaccharide backbone contributes to the recognition of ABO by many microorganisms as well as antibodies. In the skin, blood group antigens are expressed in stratum corneum, stratum granulosum, stratum spinosum, acrosirringium and hair follicle regions[8,13,14].

The distribution of ABO and Rhesus blood groups may vary according to different geographies and ethnic groups[3]. It is known that genetic factors such as HLA and blood groups may be associated with infectious diseases. In addition, case-controlled studies have shown a significant association between specific HLA antigens in various diseases and ABO blood group[9,15]. In the current study, 41 (42.7%) patients had A, 21 (21.9%) patients had B, 11 (11.5%) patients had AB, 23 (23.9%) patients had 0 blood groups in the patient group. In the control group, 126 (44.1%) individuals had A, 46 (16.1%) individuals had B, 30 (10.5) individuals had AB, 84 (29.3) individuals had 0 blood group.

Similarly, different studies have shown that HLA antigens and ABO blood groups have important relationships with various autoimmune diseases such as multiple sclerosis, rheumatoid arthritis, juvenile

diabetes, psoriasis, duodenal ulcer, gastric ulcer and pernicious anemia and celiac disease[4,16]. In a study by Woolf, it was reported that the likelihood of some diseases could increase up to 39% compared to the blood group type[17]. Recent structural and functional studies have brought a new perspective to molecular mechanisms and explained why individuals with certain blood groups have increased risk of infection[14].

Differences in blood group antigen expression affect the host susceptibility to many infections. Blood groups can act as receptors and / or coreceptors for bacteria, viruses, parasites and can play a direct role in infection. The simultaneous disintegration of genes (genetic imbalance) or the antigenic expression and antibody production hypothesis may be the mechanism of explaining the relationships betweenblood types and many different diseases[7,8].

A wide variety of human pathogens recognize blood group antigens. These include viruses, bacteria and fungi that invade the host tissue using viral plating proteins, microbial adhesives, soluble lectins, and toxins[14]. Blood antigens are most concentrated in mucin, which is at the forefront of contact with bacteria and viruses. Blood antigens in mucin may be responsible for the binding of certain pathogens and may help the immune system in the removal of pathogens. These antigens can also provide nutrients to bacteria and parasites[9]. Genetic studies have shown that individuals with A blood group are more resistant to influenza virus, although they are more risky for acute rheumatism[6].

In addition, investigations have been conducted on the relationship between blood groups and infections such as Mycobacterium and Vibrio cholera infections, measles and mumps[9]. Hutson et al. showed that people with blood type O were 11.8 times more likely to be infected with Norwalk virus, and blood group B had a protective role[18]. Young and Roth suggested that individuals with blood A are more prone to dermatophytosis and that there is cross-reactivity between glycoproteins isolated from Trichophyton mentogrophytes and human isoantigens A1 and A2[19]. Deresinski et al. Reported the prevalence of increased coccidioidomosis in individuals with blood type B[20]. Tuberculoid leprosy was found to be associated with blood group O, lepromatous leprosy with blood group A and B, gonorrhea with blood group B, smallpox with blood group A and B and Escherichia Coli O 157 infection with blood group O[8,9,14,20]. In the current study, we found no relationship between anogenital wart development and ABO-Rh blood groups.

Changes in the release of ABO antigens from the epithelium have been found to be associated with wound healing, oral mucosal cancers, and maturation of cells. Helicobacter pylori, which causes gastric cancer and peptic ulcer, is known as a gastric pathogen and studies have shown the ability of Helicobacter pylori strains to bind to O blood group[6]. The relationship of cancers with blood groups has been investigated in many cancers such as salivary gland, laryngeal, hypopharyngeal, esophagus, lung, cardiac, gastric, gynecological, colorectal, pancreatic, bone, bladder, ureter, kidney, breast, prostate, testicular tumors and uveal melanoma[13].

In a study by Mouhari-Toure et al., no significant relationship was found between the blood groups and the presence of keloid[21]. In a study by Moshaverina et al. in Iran, there was no significant relationship between ABO blood group and oral lichen planus[22]. There are several studies reporting different results about the relationship between blood type and psoriasis, some researchers have suggested that psoriasis is more common in individuals with O blood group, while some researchers have suggested that there is no relationship between psoriasis and blood groups[5].

Giorgia et al. reported a slight increase in the risk of malignant melanoma in patients with O Rh-negative blood group[23]. Cihan et al. reported that the A Rh (+) distribution was higher and the 0 Rh (+) distribution was lower than the control group in patients with BCC.[24] Similarly, Iodice et al. showed that most patients with non-melanoma skin cancer were A Rh (+).[25]

Results of the study examining the relationship between blood type and vitiligo are contradictory, because there are studies reporting that the frequency of AB blood groups is higher in vitiligo cases than in other blood types, whereas in some studies there is no relationship between ABO blood group and vitiligo[5]. In a study conducted by Terzi et al. in Turkey, the incidence of acne vulgaris was higher in the AB blood group and lower in the O blood group[13]. Macsween et al. investigated the relationship between ABO blood groups and skin diseases and found that seborrheic dermatitis was more common in patients with B blood group and

lichen planus was more common in patients with A blood group[26].

We planned this study with the hypothesis that HPV which causes anogenital warts can penetrate the epidermis and use blood group antigens expressed in the epidermal layer. In conclusion it seems there is no relationship between ABO-Rh groups and anogenital wart. But we think this hypothesis is interesting and to clarify whether anogenital wart development is easy in some blood groups, further studies are needed in different races and geographic regions.

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